D. Louderback, Herbert E. Gregory, W. G. Miller, T. L. Walker, Andrew C. Lawson, C. W. Hayes, G. D. Harris, Alfred W. G. Wilson, R. W. Brock, A. H. Purdue, I. C. White, Frank R. Van Horn, Alfred C. Lane, H. M. Ami, J. S. Diller, H. P. Cushing, A. P. Coleman, R. D. George, Samuel Calvin, W. G. Tight, John E. Wolff, Arthur M. Miller, F. W. Cragin and E. O. Hovey. There were in addition at least five visiting geologists, not members of the society, and many students and casual visitors.

The Cordilleran Section met with the general society. On Tuesday, December 31, the section held a business session at which Andrew C. Lawson and George D. Louderback were reelected chairman and secretary respectively.

The following officers were elected by the general society for the year 1908:

President—Samuel Calvin, Iowa City, Iowa.

First Vice-president—George F. Becker, Washington, D. C.

Second Vice-president—A. C. Lawson, Berkeley, California.

Secretary—Edmund Otis Hovey, New York City.

Treasurer—William Bullock Clark, Baltimore, Md.

Editor—Joseph Stanley-Brown, Cold Spring Harbor, N. Y.

Librarian—H. P. Cushing, Cleveland, Ohio.

Councilors—H. P. Cushing, Cleveland, Ohio, and H. B. Patton, Golden, Colorado.

The council voted to accept the invitation which had been received from the authorities of Yale University to meet in New Haven, Conn., next winter. It was decided to hold the meeting during the week of December 29, 1908.

EDMUND OTIS HOVEY,
Secretary

THE AMERICAN BREEDERS' ASSOCIATION

THE fourth annual meeting of the American Breeders' Association was held at Washington, January 28–30, 1908. This association now comprises about 1,100 members and includes the more active breeders of the country, both those engaged in plant breeding and those who are breeding animals. It has attempted to bring together those who are doing breeding work with scientific aims and those whose aims are primarily commercial or "fancy." This attempt has been successful to a marked degree; not only in the meetings of the association, which have been well attended by all classes of breeders, but also in the three year-books which have appeared and which undoubtedly have skimmed the cream of the stupendous yield of results of the breeding industry during the past few years. Take, for example, the last year-book. It contains papers on breeding horses by Professor C. W. Gay, of the Ohio State University; cattelo by C. J. Jones ("Buffalo" Jones), of Nevada; dairy cattle by M. A. Scoville, Director of the Kentucky Agricultural Experiment Station; swine by Professor D. A. Gaumnitz of the Minnesota Station, and Geo. M. Rommel, of the U. S. Department of Agriculture; poultry by Professor J. E. Rice, of Cornell University; sugar beets by J. E. W. Tracy, of the U. S. Department of Agriculture; corn by Eugene and J. D. Funk, of Funk Brothers, Illinois, leading commercial breeders; carnations by J. B. Norton; nut and forest trees by Messrs. Sudworth and A. D. Hopkins, of Washington. There are theoretical papers by Castle, Shull, Q. I. Simpson, C. W. Ward, Spillman and others, the commercial men uniting with the theoretical men in these papers also.

The Washington meeting was not behind its predecessors in interest. Reports of committees occupied, perhaps, a larger part of the program than hitherto. Among these reports may be mentioned that of Mr. David G. Fairchild on the "Introduction of Animals and Plants." He called attention to the danger of introducing

noxious plants and animals with the useful and urged that investigations should be made as to the best method of shipping plants and animals so as to prevent introducing diseases or injurious insects. Methods of quarantine should be made the object of a rigorous scientific inquiry. The discussion brought out the present danger from the importation to this country of a *Peronospora* disease of corn that has recently appeared in Java; and a new disease that appeared among cattle in India two years ago and has cost much to eradicate.

A report on "Animal Hybridizing" was read by Professor W. J. Spillman. The greater part of the report was based on the work of Mr. M. M. Boyd, of Bobcaygeon, Ontario, who is crossing bison and cattle. The hybrids are large; the hump of the bison is dominant (though incompletely so) and, in consequence, the cuts of this part of the vertebral column contain, in the hybrid, double the quantity of lean meat that is yielded by cattle. The lean hind quarters of the bison are recessive, consequently the hybrid offers large cuts of meat in this valuable portion also. Certain difficulties occur in hybridizing. The bison is usually taken as bull, but the abnormal amount of amniotic fluid produced frequently kills the cow, so the cow must be as large as possible. More male hybrids die early than females and they are often sterile, but several good breeders were obtained that were fertile with either parent species. Mr. Spillman referred also to the practical application among breeders of the knowledge that the polled condition is a mendelian dominant. An investigation is being made by the committee on the relative vigor of hybrid hogs over pure bred. A case was cited of the recent discovery by a Michigan wool buyer of two samples in his stock that were worth 90 cents per pound as compared with 25 cents for other wool. An attempt will be made to find the origin of this peculiarly valuable wool.

Mr. C. M. Winslow, of the Ayrshire Breeders' Association, spoke of methods used by the association for perfecting the breed. He traced the history of the breed from the native wild cattle of Ayr in Scotland through the first stages of their improvement in 1700 until they were first imported to America in 1837. He stated that the ideal is the creation of a dairy producer rather than a show ring cow and that tests of the milk production of a cow for advanced registry extend over a full year.

A paper by Mr. J. J. Hemingway, of the American Jersey Cattle Club, was read by Dr. W. H. Dexter, of Washington. The history of Jersey cattle in America was traced from their introduction into the United States in 1850. He stated that the ideals of the club were beauty of form inside the type and much milk rich in butterfat; and cited many cases of extremely high performances of individual cows.

Professor Andrew Boss, of the Minnesota Agricultural College, reported on "Breeding for Meat Production." Improvement is brought about by considering performance first and ancestry second. Progress is hampered by the necessity of judging "on the block"—the prize winning individual can not be a breeder. Improvement is made by breeding from individuals that gain weight economically, that are prolific breeders, and that belong to strains or families that show well when cup up for market. Feeding records, breeding records and block records are the basis of improvement. It is also desirable to attempt by breeding to gain disease-resistant strains. In the discussion Mr. Spillman spoke of the high percentage of tuberculosis of calves fed on skim milk or following cows.

If placed early on grass or fed grain they were relatively clear of disease.

Mr. W. M. Hays, assistant secretary of agriculture, reported on cooperative work in animal breeding. He divided the subject into the three classes of creative breeding on the production of new races; pure bred breeding, or the improvement of established races; and herd or grade breeding, or the improvement of ordinary farm stock. He spoke of the work of the committee in the collecting of data concerning individual performance and breeding power and proposed the establishment of circuit breeding as a means of finding individuals with which to establish new and valuable strains.

Professor H. J. Webber reported for the Committee on Theoretical Research in Heredity. He referred to certain deviations from mendelism in apparently mendelian phenomena. Thus in cotton the upland race has smooth black seeds and this smoothness is recessive to the fuzzy type. But the F_1 generation shows all gradations of fuzziness, and it is hard to fix any one of these types. Thus if one selects to breed for the second generation seeds of the black smooth type fuzziness appears in that generation. Dr. Webber also referred to the practise of corn breeders in preventing self-fertilization as based on insufficient evidence; and suggested that we need additional evidence that close inbreeding of corn results in loss of vigor.

Professor Spillman read a paper entitled "Mendelian Phenomena and Discontinuous Variation Color Factors in the Mammalia." He referred to the mendelian nature of poll in cattle. He argued that the fact of the absence of an intermediate type to-day is no proof of the absence of an intermediate form in the ancestry of the existing races. Discontinuity of variation is due to the complexity of the characters of a race. Variations that appear to be discontinuous are due to new combinations of characters. He spoke of belting and other sorts of color inheritance in swine and other mammals.

C. B. Davenport in continuation of the report on heredity gave evidence from poultry breeding that between discontinuous and continuous variation there are all degrees; and that mendelian inheritance differs not in kind but only in degree from the blending inheritance of biometricians.

Mr. C. W. Ward spoke of heredity in carnations. He finds that the amount of any character in the offspring depends upon the proportion of ancestor in which that character occurs. Thus two white flowers may throw all white, but if there has been much pink in the ancestry they may throw some pink in the flowers. Again, the offspring of the same parents will differ with the environmental conditions of the season.

Mr. E. M. East, of New Haven, spoke of "Correlated Variations," from the standpoint of plants. Professor W. E. Castle gave an address on "Color Variations of Domesticated Animals." He stated that the colors found are selfs (either black, red, white or gray) or spotted. These various color varieties are known to us best under domestication but they occur also in nature not less than under domestication only in nature they are eliminated; the gray being the usual wild color because less conspicuous. This gray is a complex of three factors: black + yellow + a pigment pattern (banding). Where the pattern factor is absent yellow is dominated and the coat is black. The spotted condition is a mosaic that has arisen secondarily and become fixed in the germ cells.

Mr. A. F. Woods, of the U. S. Department of Agriculture, reported on "Cooperative work in Plant Breeding." First, the committee cooperates with individual farmers by distributing certain seeds.

Some seeds distributed have already developed new varieties as good as, or better than, the strains from which they came. Second, the committee cooperates in synthetic breeding—where a certain foreign variety or species is needed to secure a certain desired combination a man will be sent abroad to get the required species.

Mr. Jouett Shouse, of Lexington, Ky., read a paper on "Improvement of the American Thoroughbred Horse." He traced the history of the thoroughbred in America from "Bull Rock" imported to Virginia from England in 1730. The development of the thoroughbred was bound up with that of racing which was extensively practised from the revolution until the civil war; racing stimulated the breeding of race horses. Since the war racing in the South has languished except at the larger cities, but in the North it has developed, and to-day the thoroughbred is the best it has ever been. Breeding thoroughbreds is an industry worth many millions of dollars and supporting many thousands of people; the industry is centered in Kentucky owing to its favorable climate and soil. The thoroughbred is the foundation of the saddle horse and the standard bred, but the former has more of the thoroughbred than the latter. The great value of the thoroughbred is for crossing with farm mares; the product is the best kind of generally useful horse. The speaker opposed anything which would interfere with horse-racing as bound to discourage breeding the thoroughbred and was led to the conclusion that the elimination of gambling from racing would, by diminishing the interest in racing, have this effect.

Mr. Robert N. Sewall, of Oyster Bay, N. Y., gave an illustrated address on the "Origin of the Modern Horse and his Relationship to the Arabian." He spoke of the dual origin of the horse from the cold-blooded northern horse (Przewalski's horse) and the hot-blooded Lybian horse from which the Arabian has been immediately derived. He showed how the northern horse had been improved by crossing with the Arabian to get our best races and entered a plea for the further development of the Arabian in order further to improve our thoroughbred and standard-bred types.

Mr. C. J. Jones spoke about his work of breeding and hybridizing the American bison, and the successful attempt to make a hardier hybrid. He referred to the necessity of using large cows as mothers on account of the great amount of amniotic fluid surrounding the embryo. He also spoke of his hybrids with Persian sheep which attain a weight of nearly 300 pounds and whose mutton is of superior quality.

Dr. Alexander Graham Bell spoke for the Committee of Eugenics. His paper has been published in *The National Geographic Magazine*.

Many other papers, mostly based on the breeding of plants, were presented on Wednesday and Thursday, including reports of the committees on breeding forest and nut trees by Dr. Pinchot; tobacco, by A. D. Shamel; bush and small fruit, by Professor Hansen; corn, by Mr. J. D. Funk and Dr. Shull. On Thursday afternoon the association was received by President Roosevelt.

The following officers were elected for the year:

President—Hon. James Wilson, Washington, D. C.

Vice-president—C. W. Ward, Queens, N. Y.

Secretary—W. M. Hays, Washington, D. C.

Treasurer—N. H. Gentry, Sedalia, Mo.

Chairman Animal Section—A. P. Grout, Winchester, Ill.

Secretary Animal Section—C. B. Davenport, Cold Spring Harbor, N. Y.

Chairman Plant Section—H. J. Webber, Ithaca, N. Y.

Secretary Plant Section—N. E. Hansen, Brookings, S. Dak.

All persons interested in the science or art of breeding are invited to join the Association and to send their names to the secretary. The membership fee of two dollars includes the year-book of proceedings which can be obtained only by members.

CHAS. B. DAVENPORT

INLAND WATERWAYS[1]

To the Senate and House of Representatives:

I transmit herewith a preliminary report from the Inland Waterways Commission, which was appointed by me last March in response to a wide-spread interest and demand from the people. The basis of this demand lay in the general and admitted inability of the railroads to handle promptly the traffic of the country, and especially the crops of the previous fall.

This report is well worth your attention. It is thorough, conservative, sane and just. It represents the mature judgment of a body of men exceptionally qualified, by personal experience and knowledge of conditions throughout the United States, to understand and discuss the great problem of how best to use our waterways in the interest of all the people. Unusual care has been taken to secure accuracy and balance of statement. If the report errs at all it is by over-conservatism. It contains findings or statements of fact, a number of specific recommendations and an account of inquiries still in progress, and it is based in part on statistics and other information contained in a voluminous appendix. The subject with which it deals is of critical importance both to the present and to the future of our country.

[1] Message from the President, delivered to the Senate and House of Representatives on February 26, 1908.

Our river systems are better adapted to the needs of the people than those of any other country. In extent, distribution, navigability and ease of use, they stand first. Yet the rivers of no other civilized country are so poorly developed, so little used, or play so small a part in the industrial life of the nation as those of the United States. In view of the use made of rivers elsewhere, the failure to use our own is astonishing, and no thoughtful man can believe that it will last. The accompanying report indicates clearly the reasons for it and the way to end it.

The commission finds that it was unregulated railroad competition which prevented or destroyed the development of commerce on our inland waterways. The Mississippi, our greatest natural highway, is a case in point. At one time the traffic upon it was without a rival in any country. The report shows that commerce was driven from the Mississippi by the railroads. While production was limited, the railways, with their convenient terminals, gave quicker and more satisfactory service than the waterways. Later they prevented the restoration of river traffic by keeping down their rates along the rivers, recouping themselves by higher charges elsewhere. They also acquired water fronts and terminals to an extent which made water competition impossible. Throughout the country the railways have secured such control of canals and steamboat lines that to-day inland waterway transportation is largely in their hands. This was natural and doubtless inevitable under the circumstances, but it should not be allowed to continue unless under careful government regulation.

Comparatively little inland freight is carried by boat which is not carried a part of its journey by rail also. As the report shows, the successful development and use of our interstate waterways will require in-